

WHAT IS CLAIMED IS:

1. An optical structure, comprising:
an optical element; and
gas supplying means for supplying a gas to a
5 limited portion of a surface of the optical element,
wherein said gas supplying means blows the gas
directly against the surface of the optical element.

- 10 2. An optical structure according to Claim 1,
wherein light to be incident on said optical structure
is ultraviolet light.

- 15 3. An optical structure according to Claim 2,
wherein the light has one of wavelengths of 365 nm,
245 nm, 193 nm and 157 nm.

- 20 4. An optical structure according to Claim 1,
further comprising a plurality of optical elements and
a container isolated from a surrounding ambience,
wherein said plurality of optical elements are
disposed at least at a light entrance surface and a
light exit surface of said container, and wherein said
gas supplying means is provided at the light entrance
surface and/or the light exit surface of said
25 container.

5. An optical structure according to Claim 1,

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wherein there are a plurality of gas supplying means, each being said gas supplying means, which are disposed revolutionally symmetrically with respect to an optical axis of the optical element.

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6. An optical structure according to Claim 1, further comprising a cover for suppressing diffusion of the gas supplied by said gas supplying means to the limited portion of the surface of the optical element.

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7. An optical structure according to Claim 1, wherein said gas supplying means includes means for removing an impurity contained in the gas to be supplied to the limited portion of the surface of the 15 optical element.

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8. An optical structure according to Claim 1, further comprising a gas supplying equipment having impurity removing means, for supplying a gas to said gas supplying means.

9. An optical structure according to Claim 1, wherein the gas supplied by said gas supplying means is an inactive gas.

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10. An optical structure according to Claim 1, wherein the gas supplied by said gas supplying means

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is an atmosphere and wherein, after an impurity contained is removed by impurity removing means, the gas is supplied by said gas supplying means.

5 11. An optical structure according to Claim 1, further comprising means for adjusting a gas supplying flow rate and a pressure of the gas to be supplied by said gas supplying means, in accordance with the state of use of said optical structure.

10 12. An optical structure according to Claim 1, further comprising means for adjusting a temperature of the gas to be supplied by said gas supplying means.

15 13. An optical structure according to Claim 1, further comprising gas exhausting means for exhausting the gas supplied by said gas supplying means.

20 14. An optical structure according to Claim 13, wherein there are a plurality of gas exhausting means disposed revolutionally symmetrically with respect to an optical axis of the optical element.

25 15. An optical structure according to Claim 13, wherein said gas supplying means is disposed at one side of the optical element and wherein said gas exhausting means is disposed at the other side of the

optical element.

16. An optical structure according to Claim 13,
further comprising means for adjusting a gas
5 discharging flow rate and a pressure of the gas to be
exhausted by said gas exhausting means, in accordance
with the state of use of said optical structure.

17. An optical structure according to Claim 1,
10 further comprising (i) a plurality of optical
elements, (ii) a plurality of gas supplying means each
being said gas supplying means and disposed
revolutionally symmetrically with respect to an
optical axis of the optical element, (iii) a container
15 isolated from a surrounding ambience, wherein said
plurality of optical elements are disposed at least at
a light entrance surface and a light exit surface of
said container, and (iv) a cover for covering the
light entrance surface and/or the light exit surface
20 of said container, wherein said plurality of gas
supplying means are provided inside said cover.

18. An optical structure according to Claim 13,
further comprising (i) a plurality of optical
25 elements, (ii) a plurality of gas supplying means each
being said gas supplying means and disposed
revolutionally symmetrically with respect to an

DEPARTMENT OF STATE

optical axis of the optical element, (iii) a plurality
of gas exhausting means each being said gas exhausting
means and disposed revolutionally symmetrically with
respect to the optical axis of the optical element,
5 (iv) a container isolated from a surrounding ambience,
wherein said plurality of optical elements are
disposed at least at a light entrance surface and a
light exit surface of said container, and (v) a cover
for covering the light entrance surface and/or the
10 light exit surface of said container, wherein said
plurality of gas supplying means and said plurality of
gas exhausting means are provided inside said cover.

19. An exposure apparatus for illuminating a
15 pattern with light from a light source and for
projecting light from the pattern onto a surface to be
exposed, said apparatus comprising:
an optical structure as recited in Claim 1;
wherein the light from the light source is
20 light of ultraviolet region.

20. An apparatus according to Claim 19, wherein
the light has one of wavelengths of 365 nm, 245 nm,
193 nm and 157 nm.

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21. An apparatus according to Claim 19, wherein
said gas supplying means blows the gas against an

optical element disposed opposed to the surface to be exposed.

22. A device manufacturing method, comprising the
5 steps of:

exposing a wafer with a pattern by use of an exposure apparatus as recited in Claim 19; and
developing the exposed wafer.

10 23. An optical structure, comprising:
an optical element; and
gas supplying means for supplying a gas to a
surface of the optical element, wherein the gas
supplied to the surface of the optical element defines
15 a laminar flow at and adjacent the surface of the
optical element.

24. An optical structure according to Claim 23,
wherein light to be incident on said optical structure
20 is ultraviolet light.

25. An optical structure according to Claim 24,
wherein the light has one of wavelengths of 365 nm,
245 nm, 193 nm and 157 nm.

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26. An optical structure according to Claim 23,
further comprising a plurality of optical elements and

a container isolated from a surrounding ambience,
wherein said plurality of optical elements are
disposed at least at a light entrance surface and a
light exit surface of said container, and wherein said
5 gas supplying means is provided at the light entrance
surface and/or the light exit surface of said
container.

27. An optical structure according to Claim 23,
10 wherein there are a plurality of gas supplying means,
each being said gas supplying means, which are
disposed along a direction substantially perpendicular
to a gas supplying direction of said gas supplying
means.

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28. An optical structure according to Claim 23,
further comprising a cover for suppressing diffusion
of the gas supplied by said gas supplying means to a
limited portion of the surface of the optical element.

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29. An optical structure according to Claim 23,
wherein said gas supplying means includes means for
removing an impurity contained in the gas to be
supplied to a limited portion of the surface of the
25 optical element.

30. An optical structure according to Claim 23,

DEPARTMENT OF STATE

further comprising a gas supplying equipment having impurity removing means, for supplying a gas to said gas supplying means.

5 31. An optical structure according to Claim 23, wherein the gas supplied by said gas supplying means is an inactive gas.

10 32. An optical structure according to Claim 23, wherein the gas supplied by said gas supplying means is an atmosphere and wherein, after an impurity contained is removed by impurity removing means, the gas is supplied by said gas supplying means.

15 33. An optical structure according to Claim 23, further comprising means for adjusting a gas supplying flow rate and a pressure of the gas to be supplied by said gas supplying means, in accordance with the state of use of said optical structure.

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34. An optical structure according to Claim 23, further comprising means for adjusting a temperature of the gas to be supplied by said gas supplying means.

25 35. An optical structure according to Claim 23, further comprising gas exhausting means for exhausting the gas supplied by said gas supplying means.

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36. An optical structure according to Claim 35,
wherein there are a plurality of gas exhausting means
disposed along a direction perpendicular to a
5 direction in which the gas is discharged by said gas
exhausting means.

37. An optical structure according to Claim 35,
wherein said gas supplying means is disposed at one
10 side of the optical element and wherein said gas
exhausting means is disposed at the other side of the
optical element.

38. An optical structure according to Claim 35,
15 further comprising means for adjusting a gas
discharging flow rate and a pressure of the gas to be
exhausted by said gas exhausting means, in accordance
with the state of use of said optical structure.

20 39. An optical structure according to Claim 23,
further comprising (i) a plurality of optical
elements, (ii) a plurality of gas supplying means
disposed along a direction substantially perpendicular
to a direction in which the gas is to be supplied,
25 (iii) a container isolated from a surrounding
ambience, wherein said plurality of optical elements
are disposed at least at a light entrance surface and

a light exit surface of said container, and (iv) a cover for covering the light entrance surface and/or the light exit surface of said container, wherein said plurality of gas supplying means are provided inside
5 said cover.

40. An optical structure according to Claim 35, further comprising (i) a plurality of optical elements, (ii) a plurality of gas supplying means
10 disposed along a direction substantially perpendicular to a direction in which the gas is to be supplied, (iii) a plurality of gas exhausting means disposed along a direction substantially perpendicular to a direction in which the gas is discharged, (iv) a
15 container isolated from a surrounding ambience, wherein said plurality of optical elements are disposed at least at a light entrance surface and a light exit surface of said container, and (v) a cover for covering the light entrance surface and/or the
20 light exit surface of said container, wherein said plurality of gas supplying means and said plurality of gas exhausting means are provided inside said cover.

41. An exposure apparatus for illuminating a pattern with light from a light source and for projecting light from the pattern onto a surface to be exposed, said apparatus comprising:
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an optical structure as recited in Claim 23;
wherein the light from the light source is
light of ultraviolet region.

5 42. An apparatus according to Claim 41, wherein
the light has one of wavelengths of 365 nm, 245 nm,
193 nm and 157 nm.

10 43. An apparatus according to Claim 41, wherein
said gas supplying means blows the gas against an
optical element disposed opposed to the surface to be
exposed.

15 44. A device manufacturing method, comprising the
steps of:

 exposing a wafer with a pattern by use of an
exposure apparatus as recited in Claim 41; and
 developing the exposed wafer.